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EVALUATION MODEL FOR INNOVATIVE RESEARCH PROJECTS IN THE 2014–2020 PERSPECTIVE

Key words

Evaluation process, project evaluation, product evaluation, evaluation criteria, the 2014–2020 perspective, entrepreneurs, national and regional calls, project submission.

Abstract

The paper presents an original evaluation model for innovative research projects that can be used by entrepreneurs and other institutions in the process of project management. The model has two aims: to be a support for the organisations, which plan to submit the project proposal (*ex-ante* evaluation) and, on further stages of the project (*on-going*, *ex-post*, *follow-up*), to decide if the topics undertaken in the project are worth being continued or terminated. The requirements of the evaluation process from the 2014–2020 perspective are considered in the model as this perspective is directed to companies, although the research institutions also can take part in the projects. The aim of the 2014–2020 perspective is to support companies in developing products that should be successfully implemented in their business activity or on the market; therefore, the evaluation must be performed precisely and carefully, and it should indicate the elements that are compulsory for the *ex-ante* evaluation, and which must be considered when applying for funds.

Introduction

Science–business cooperation is a significant problem for these two environments in aspects of a knowledge-based economy [1, 2]. The results concerning the activation of scientists and entrepreneurs are still unsatisfactory. In practice, it turns out that the science world is interested in cooperation and scientists want to develop innovative solutions for companies. On the other hand, the entrepreneurs do not take many initiatives to collaborate with universities or other research institutions. There are many reasons for this attitude, such as a divergence of interests, the different aims and high costs of research, insufficient knowledge of entrepreneurs on how to create innovations and the lack of belief in the cooperation with scientists. For these reasons, trust between companies and research institutions is very low [3, 4].

As the example, concerning micro and small companies, there is a lack competences and resources, which could be suitable to create innovations [5]. In this group, the need for innovations is very low. Research results are not attractive for these types of companies. On the other hand, research institutions have limited knowledge on market needs, and they are not interested in the commercialisation process.

In order to improve communication and to highlight the needs of enterprises, the 2014–2020 perspective [6] gives funding mainly to industry. Research institutions are usually sub-contractors, which can offer products for the company that cannot be built by the company itself. The European Commission in several decrees indicated areas that are strengthened by financing. Some of these areas are directed to companies and they concern investments in research and innovations and the increase of competitiveness on the market.

However, in order to apply for funds, it is necessary to write applications that must be accepted by the funding organisations. Moreover, if the project is accepted, it is compulsory to correctly manage the project, especially to systematically evaluate it. The entrepreneurs may not have the knowledge needed to cope with evaluations [7]; therefore, the authors of this article propose an evaluation model that can be used in various stages of project management. The proper use of the model will enable the entrepreneurs and other institutions to manage the project efficiently.

1. Requirements for evaluation in the 2014–2020 perspective

The 2014–2020 perspective has specified evaluation criteria for proposals of innovative research projects, which are submitted to apply for funding. Having analysed ex-ante evaluation criteria in several programmes offered by the National Centre for Research Development and within Regional Operational

Programmes [8], the most common evaluation criteria are listed below for various calls (Table 1).

Table 1. Evaluation criteria at the ex-ante stage, which are common in various initiatives in the 2014–2020 perspective

Criterion	Description
Project includes both industrial and experimental research	The project includes two types of research: industrial and experimental. It is underlined that the project without experimental research does not get funds.
Diffusion effects of the R&D activity	The diffusion effect must be only fulfilled by big enterprises. They must plan the cooperation with SMEs or research organisations during the project execution or during 3 years after its completion.
Project compliance with smart specialisation	The main product of the project must be relevant with smart specialisation.
Development of product or process innovation	The aim of the project is to develop either product innovation or process innovation. Other kinds of innovations (marketing and organisational) are not acceptable.
Implementation of project results to the business activity of the entrepreneur	The enterprises that implement the results of industrial or experimental research are promoted. The implementation must take place within 3 years after the project is completed. Within partnership projects, the implementation can take place in an enterprise or in a partner institution that is not a research unit.
Cooperation with R&D institution	The 2014–2020 perspective promotes the cooperation of the "science-industry" type.
Participation of the applicant in a key cluster	The project should be executed by the company or the consortium, which are included into the key cluster.
Necessity to invest more equity	These projects are promoted in which the EU funding is decreased by the inclusion of more equity of the entrepreneur (mainly in regional initiatives).
Identification of possible risks	The risks should be specified at the following stages: • The research execution; and, • The implementation of new or modified products or technologies to the market.
Development of the outcomes needed on the market	Two criteria are assessed: market needs and the profitability of the implementation.
Originality of the R&D results	The originality is assessed with the following approaches taken into account: Is the product new on the market? Is the product new in the world? Is the product part of emerging innovation?
Transregional character	The projects of transnational character are promoted. The project should be executed in the consortium with at least one organisation from another region, or the project should be executed in the area of more than one region.

Source: Authors.

As it can be read in the guides of the calls for proposals, the ex-ante evaluation is done by panel experts, who assess both formal and content-related aspects. The proposed model should at least include the criteria from Table 1.

Depending on the needs, the organisation can include additional criteria that seem to be crucial for ex-ante internal evaluation. In order to increase the chances of the project acceptation, it is necessary to evaluate the project proposal before the submission of the application internally by the organisation. The question is "Which evaluation model should be used?"

2. Evaluation models

Having analysed the state-of-the-art on the evaluation models, the authors present the most complex classification of evaluation models elaborated by D.L. Stufflebeam. Four model groups are identified as follows:

1) Models directed at facilitating the effectiveness of R&D tasks undertaken within research programmes or aimed at increasing staff responsibilities for the tasks realised: the decision model [9], the client-centred model [10], or the accreditation model [11];
2) Quasi-evaluation models (directed at finding answers to questions occurring at the time of the evaluation, and they use traditional research methods): the objective-based model [12], the accountability model [13], outcome evaluation as value-added assessment model [14], the performance testing model [11], the experimental model [15], the management information model [16], cost-benefit analysis [17], the clarification hearing model [18], the case study model [19], the criticism and connoisseurship model [20], the theory-driven model [21], or mixed-method studies [11];
3) Social models (assuming that, apart from the experts and the project management board, beneficiaries of research projects should also participate in their evaluation, because they are the ones to use technologies developed within research programmes in the future): the responsive & participatory model [22], the constructivism model [23], the deliberative and democratic model [24], or the utilisation-focused evaluation model [25];
4) Pseudo-evaluation models (concentrating on the positive effects of the programme and neglect any negative aspects of its realisation. They are mainly used by institutions that want to attract beneficiaries and persuade them to participate in the programme or to purchase its material results): public relations model [26], or the politically controlled model [27].

The identified models do not propose a set of criteria that should be taken into consideration. On each evaluation stage, they only include the evaluation methods and present the overall outline of the evaluation. In order to successfully submit the project proposal and to execute it correctly, the enterprises and other organisations need to have a model that could be applied at different stages of the project execution.

3. The proposition of evaluation model for innovative research projects in the 2014–2020 perspective

The 2014–2020 perspective specifies ex-ante evaluation criteria, both formal and content-related. Table 1 contains only content-related criteria. The criteria for on-going, ex-post, and follow-up stages are not taken into account. The authors of this article pay attention only to the content-related criteria. Having analysed several programmes offered in the 2014–2020 perspective and evaluation models available in the literature, the authors propose the evaluation model, which could be applied when submitting the project proposal and in further phases. The model, which is offered by the authors, includes selected approaches from Stufflebeam's classification: the objective-based model (one of the main aims of the authors' model is to verify if the objectives of the project are fulfilled), mixed-method studies (various methods are proposed) and responsive & participatory model (the participation of beneficiaries is assumed).

The assumptions of the model are the following:

- The aim of the model is to support the submission of the project proposal with success and to manage the project on various stages of its execution.
- The model is designed for enterprises and other public and private institutions willing to manage the project.
- The model includes chosen content-related evaluation criteria proposed in the 2014–2020 perspective, which are common for several initiatives.
- The model includes the methods aiming at the assessment of individual products and the methods aiming at the research project as a whole.
- The evaluation is conducted by the team of experts who have knowledge and skills in evaluating the projects.
- The model is open, which means that it is possible to add any elements, if needed.

The proposed evaluation model includes four stages on which the project should be assessed (ex-ante, on-going, ex-post, follow-up). The proposed model is to be applied internally by the organisation, which submits the application and executes the project after its acceptation by the financing organisation. The model is presented in Figure 1.

The authors assumed the following phases of the methodology (Fig. 1):

- The ex-ante phase before the submission of the project proposal,
- The on-going evaluation during the execution of the research project,
- The ex-post evaluation when completing the project, and
- The follow-up evaluation 2–4 years after the project completion.

The aim of the ex-ante evaluation is to assess the project proposal before its submission to the organisation financing the initiative. This stage includes the product and project evaluation. The product evaluation includes the assessment

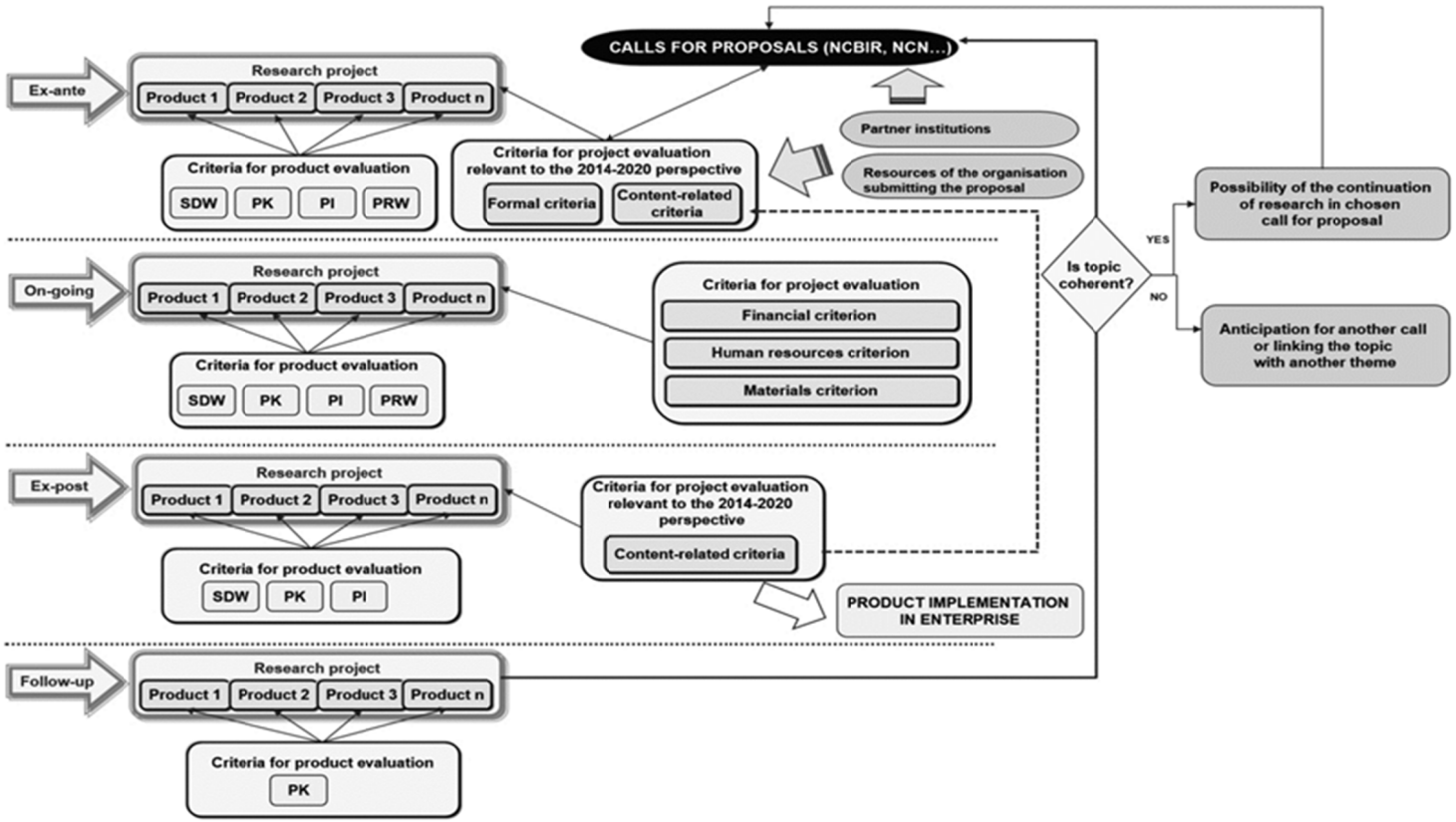

Fig. 1. The evaluation model for innovative research projects executed in the 2014–2020 perspective

Source: Authors.

methods aiming at the following aspects: the implementation maturity [28], the commercial potential [29], the innovativeness [30], and the implementation risk [31]. The product evaluation is performed by the expert panel with the use of the methods mentioned above.

The project evaluation aims at including all elements that are required in the call for proposal and which must be fulfilled in order for the proposal to be positively assessed. Therefore, the evaluation consists of formal and content-related parts. The formal part includes the aspects concerning the application, the applicant, the project, and specific elements, which must be assessed. The organisation that desires to submit the project proposal must recognise the formal requirements in detail that need consideration.

The factual evaluation of the project proposal includes criteria that result from a set of evaluation criteria considered in the 2014–2020 perspective. The criteria are divided into entry criteria and point criteria (0–5 points). The list of criteria is included into the document specifying and describing all evaluation criteria, and it is attached to each call for proposal.

The ex-ante evaluation proposed by the authors will enable one to verify the proposal and to minimise the risk of project rejection. It will be possible through making the detailed assessment of the products planned for development and the project as a whole.

The on-going evaluation is a systematic process, which takes place during the project execution. It should be performed more or less every six months. The authors propose the on-going product evaluation with the methods applied at the ex-ante stage. This effort aims at verifying if any changes have appeared since the evaluation was done last time. Apart from the product evaluation, it is necessary to perform the project evaluation with the following aspects taken into consideration:

- Financial criterion, in order to know how the budget is spent;
- Human resources criterion, in order to know if there is sufficient number of people participating in the project;
- Material criterion, in order to know if the executors of the project have enough supplies for the development of the planned results.

The authors proposed such criteria in order to cover crucial aspects under the evaluation process. The on-going evaluation allows for the comparison of current and past situations and allows one to take any steps needed.

The ex-post evaluation is performed at the end of the project. This kind of evaluation includes the product evaluation with the use of the following assessment methods: the implementation maturity, the commercial potential, and the innovativeness. The project evaluation is done with a special attention paid to the implementation of the product in the enterprise, since it is the main assumption of the calls for proposals in the 2014–2020 perspective. If the product is not successfully implemented, it is impossible to state that the project is completed.

The last step proposed by the authors is related to the follow-up evaluation, which should be performed between 2 and 4 years after the completion of the project. This evaluation focuses only on the commercial potential assessment of the product, since it can change in time. Other aspects are not taken into account.

The ex-post and the follow-up stages are important to check if there are any opportunities to submit another project within this area. In order to do so, it is indispensable to check what calls for proposals are currently offered and if they are suitable for our topics. If so, the organisation must take appropriate steps to write another project proposal. If not, either they wait for another call for proposals, or they try to link the topic with another theme, which is suitable for current calls for proposals.

Conclusions

The 2014–2020 perspective offers a huge amount of money, mainly for entrepreneurs. As opposed to the 2007–2013 perspective, the entrepreneurs are the main beneficiaries of the funds. However, they are not experienced in submitting the project proposals. Therefore, it is very important to teach them what aspects should be considered in the submission process and what they should pay attention to while executing the project. The proposed evaluation model is a proposition for the enterprises and other institutions, if needed. It is also a means to evaluate the initiative during the life span, beginning from the ex-ante stage until the follow-up phase. When applied systematically, it will ensure effective and efficient work in every project.

Scientific work executed within the ‘Models for generating, evaluating, and implementing of innovative research project with the use of research project generator’ Statutory Activity.

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Model ewaluacji innowacyjnych projektów badawczych w perspektywie finansowej 2014–2020

Słowa kluczowe

Proces ewaluacji, ewaluacja projektu, ewaluacja produktu, kryteria ewaluacji, perspektywa finansowa 2014–2020, przedsiębiorcy, konkursy krajowe i regionalne, złożenie projektu.

Streszczenie

Artykuł przedstawia autorski model ewaluacji innowacyjnych projektów badawczych, który może zostać zastosowany przez przedsiębiorstwa i inne instytucje w procesie zarządzania projektem. Model ma dwa cele: być narzędziem wspomagającym dla organizacji, które planują złożyć propozycję projektu (ewaluacja *ex-ante*) oraz, na dalszych etapach projektu (*on-going*, *ex-post*, *follow-up*), umożliwiać podjęcie decyzji, czy uruchomione tematy należy kontynuować, czy zaprzestać. W modelu uwzględniono wymagania dotyczące ewaluacji w perspektywie finansowej 2014–2020, jako że ta perspektywa skierowana jest głównie do firm, mimo że inne instytucje również mogą brać udział w projektach.

Celem perspektywy finansowej 2014–2020 jest wspomaganie przedsiębiorstw w opracowywaniu produktów, które powinny być pomyślnie wdrożone w ich działalności gospodarczej lub na rynku, dlatego też ewaluacja musi być prowadzona starannie i dokładnie i powinna uwzględniać elementy, które są obowiązkowe w ewaluacji ex-ante propozycji projektu.